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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MCDONALD, RODNEY GLENN

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 08/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/004,212

Applicant(s)

GROHMAN ET AL.

Examiner

Rodney G. McDonald

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 6-9 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Claim Objections

Claim 4 is objected to because of the following informalities:

Claim 4 is objected to because in line 3 "annual" should be "annular".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Hunt et al. (U.S. Pat. 5,674,367).

Hunt et al. teach that the target blank 10 is fabricated from a material suitable for forming a thin a thin film on a substrate during a sputtering process. This includes materials such as aluminum alloy, gold, silver, copper, platinum, and titanium, which are of a purity suitable for the sputtering process. In a preferred embodiment, the target blank 10 is fabricated from titanium. The target blank 10 is substantially disc shaped and includes a horizontal bottom surface 14 and a vertical peripheral wall 16. The mounting ring 12 has a substantially annular shape and includes a vertical interior wall 18 for defining a circular aperture 20, which extends through the mounting ring 12. The aperture 20 is sized smaller than the target blank 10 by an amount sufficient for forming an interference fit between the target blank 10 and the aperture 20. In one embodiment,

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the outer diameter of the target blank 10 is approximately 13.572 inches and the diameter of the aperture 20 is approximately 13.558 inches. Further, the mounting ring 12 includes a cover mounting surface 26 adapted for being mounted to a chamber cover as will be described. In addition, the mounting ring 12 and the target blank 10 each have a first thickness 24. (Column 2 lines 65-68; Column 3 lines 1-18)

In addition it is noted that the mounting ring 12 may be fabricated from the same material as the target blank 10 or alternatively, from a different material than the target blank 10 suitable for forming and maintaining the interference fit. (Column 3 lines 36-40)

Referring to FIGS. 4A-4C, alternate embodiments for the first interface 28 are shown in enlarged views. In particular, each of the embodiments depicted in FIGS. 4A-4C enhance the structural integrity of the target assembly 32. In FIG. 4A, a first alternate embodiment is shown wherein the peripheral wall 16 includes a notch 42 and the interior wall 18 includes a projection 44 which mates with the notch 42, thus capturing the target 38. In FIG. 4B, a second alternate embodiment is shown wherein the interior wall 18 includes the notch 42 and the peripheral wall 16 includes the projection 44, thus capturing the mounting ring 12. Referring to FIG. 4C, a third alternate embodiment is shown wherein at least one pin element 46 extends through the peripheral 16 and interior 18 walls, thus capturing both the target 38 and the mounting ring 12. By way of example, three pin elements spaced 120 degrees relative to each other may be used. (Column 4 lines 8-23)

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. (U.S. Pat. 5,674,367) in view of Fukushima et al. (Japan 63-143258).

Hunt et al. is discussed above and all is as applies above. (See Hunt et al. discussed above)

The differences Hunt et al. and the present claims is that the mechanical interlocking lip consists of a first annular lip and an annular mating lip, utilizing a backing plate and affixing the backing plate with solder is not discussed.

Fukushima et al. teach that to easily obtain a large-sized target which is free from contamination by pressing plural sheets of thin plate-shaped target elements consisting

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of Te, Te alloy, Se alloy, etc., at side part end faces formed with inclined or curved planes, curved faces, etc., and brazing the same to a cooling plate. (See Abstract)

The large-sized target is obtained by pressing plural sheets of the thin plate-shaped target elements 1 consisting of Te, Te alloy or Se alloy which is brittle and has no malleability, to each other at the side part end faces 1a, 1a facing each other and joining the same by brazing onto the cooling plate 3. (*This is the required joining by soldering to a backing plate*) The side part end face 1a of the above-mentioned method is formed to the plane-inclined by, for example, about 30° with the cooling plate 3.

Sputtering of the constituting components such as the brazing filler metal 2 and cooling plate 3 during sputtering is thereby obviated and the large-sized target, which can form the thin films without contamination, is easily obtained at a high yield. (See Abstract)

From Figures 3 and 4 suggest various interlocking lip structures. (See Figures 3 and 4)

The motivation for utilizing two annular lips is that it allows for preventing contamination. (See Abstract) The motivation for joining by soldering the assembly to a backing plate is that it allows for cooling. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Hunt et al. by utilizing a backing plate and interlocking structure as taught by Fukushima et al. because it allows for cooling the target assembly and preventing contamination during sputtering.

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Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. in view of Fukushima et al. as applied to claims 1-3, 6 and 7 above, and further in view of Ivanov et al. (U.S. Pat. 5,522,535).

The difference not yet discussed is replacing the target.

Ivanov teach methods for facilitating recycling of backing plates in bonded target/backing plate assemblies and structural assemblies for use in these methods are disclosed. The target and backing plate are joined by a solder paste material that may be applied to adjoining surfaces of the target and backing plate at low temperature. The paste solidifies to have a high decomposition temperature on the order of greater than 400 C. Provision of a solder layer having a liquidus temperature of about 100-250 C between the backing plate and solder paste allows for easy target and backing plate separation and subsequent backing plate reuse. (See Abstract)

The motivation for replacing the target is that it allows for reuse of the backing plate. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Fukushima et al. by replacing the target as taught by Ivanov et al. because it allows for reuse of the backing plate.

Allowable Subject Matter

Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The following is a statement of reasons for the indication of allowable subject matter:

Claim 4 is indicated as being allowable because the prior art of record does not teach one of the lips defining an annular groove and the other of the lips defining an annular ridge mating with the groove.

Response to Arguments

Applicant's arguments filed 7-7-03 have been fully considered but they are not persuasive.

At the outset it should be noted that independent claim 1 has been amended to require that the two parts are made of the same deposition material and that claim 8 has been amended to require that the two parts form a cohesive unit.

In response to the argument that the references do not teach forming the two parts of the same material, it is argued that Hunt et al. at Column 3 lines 36-40 state that both parts, the mounting ring and target, can be made of the same material which meets Applicant's claim limitations.

In response to the argument that the references do not teach forming a cohesive target, it is argued that in Figs. 4A and 4B that target is cohesive in that there is no gap between the two parts which prevents sputter particles or plasma from entering the gap which meets Applicant's claim limitations. (See Hunt et al. Figs. 4A and 4B)

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 703-308-3807. The examiner can normally be reached on M- Th with Every other Friday off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 703-308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9310 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
July 31, 2003
